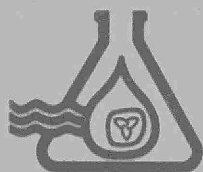


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## **Drinking Water Surveillance Program**

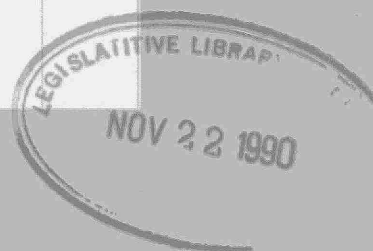
# **BRANTFORD WATER TREATMENT PLANT**

**Annual Report 1987**



**Environment  
Ontario**

Jim Bradley, Minister



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**BRANTFORD  
WATER TREATMENT PLANT**

**DRINKING WATER SURVEILLANCE  
PROGRAM**

**ANNUAL REPORT 1987**

**ONTARIO MINISTRY OF ENVIRONMENT  
OCTOBER 1988**

### ACKNOWLEDGEMENTS

The Drinking Water Surveillance Program (DWSP) employs a team approach requiring the co-operative effort of the Ministry of the Environment (MOE) staff from Water Resources and Laboratory Services Branch and the Regions, as well as plant operational staff from the Municipalities.

This annual report was produced by the DWSP Group (Ron Hunsinger, Peter Bohm, Carol Sackville-Duyvelshoff, Chris Fung and John McGrachan) and by Pat Lachmaniuk (on developmental assignment to the Drinking Water Section).

Helpful input and reviews were received from Drinking Water Section Staff, in addition to reviews by other MOE and municipal personnel.

## EXECUTIVE SUMMARY

### DRINKING WATER SURVEILLANCE PROGRAM

#### BRANTFORD WATER TREATMENT PLANT 1987 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored.

The Brantford Water Treatment Plant is a conventional treatment plant which treats water from the Grand River. The process consists of coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation. This plant serves a population of approximately 75,000 and has a design capacity of 90 x 1000m<sup>3</sup>/day.

Water samples from two distribution system sites were taken on a monthly basis beginning in March. Sampling at distribution system site three was discontinued in August and a new location was selected. Sampling of the raw water and the treated water began in December. The Brantford Water Supply was sampled for approximately 160 parameters, 10 times during 1987. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organic (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polyaromatic Hydrocarbons, Specific Pesticides and Volatiles). Specific Pesticides were analysed for in December only. Chlorophenols were not analysed for.

A summary of results is shown in Table 1.

Due to the sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water; however routine bacteriological monitoring as recommended in the Ontario Drinking Water Objectives is carried out by the operating authority. In terms of the limited DWSP bacteriological examination the water was of good quality.

Inorganic and Physical parameters were below respective health related ODWOs.

Of a total of approximately 110 Organic parameters tested for on a monthly basis, only one exceeded an ODWO; Trihalomethanes (ODWO 350 ug/L) were found at 356.3 ug/L in a July distribution system sample.

Many of the substances analysed for were naturally-occurring or treatment by-products.

During 1987 the DWSP sampling results indicated that the Brantford Water Supply produced good quality water at the plant and this quality was maintained throughout the distribution system.

## SOMMAIRE

### PROGRAMME DE SURVEILLANCE DE L'EAU POTABLE

#### STATION D'ÉPURATION DE L'EAU DE BRANTFORD

#### RAPPORT ANNUEL 1987

Le Programme de surveillance de l'eau potable (PSEP) de l'Ontario fournit des informations immédiates, fiables et à jour sur la qualité de l'eau potable. Le PSEP a débuté officiellement en avril 1986. Il est destiné à englober tous les réseaux municipaux d'alimentation en eau de l'Ontario. Actuellement, 44 stations en font partie.

La station d'épuration de Brantford est une station classique qui traite l'eau de la rivière Grand. Le traitement comporte la coagulation, la floculation, la décantation, la filtration, la désinfection et la fluoration. Cette station dessert une population d'environ 75 000 habitants et a une capacité nominale de 90 x 1 000 m<sup>3</sup>/jour.

Des prélèvements du réseau de distribution ont été effectués mensuellement à partir du mois de mars. L'échantillonnage a été discontinué au site n° 3 en août, et un nouveau site a alors été choisi. Quant à l'échantillonnage de l'eau brute et de l'eau traitée, il a commencé en décembre. Dix fois en 1987, les prélèvements ont été analysés par rapport à environ 160 paramètres dans les catégories suivantes : bactériologique, inorganique et physique (analyses en laboratoire et sur place, présence de métaux) et organique (composés aromatiques chlorés, chlorophénols, pesticides et BPC, dérivés phénoliques, hydrocarbures aromatiques polynucléaires, pesticides particuliers et composés volatils). Les pesticides particuliers n'ont été analysés qu'en décembre, et les chlorophénols ne l'ont pas été du tout.

Le tableau 1 résume les résultats obtenus.

En raison de la fréquence des prélèvements (un par mois), le PSEP ne permet pas d'évaluer tous les aspects de la qualité bactériologique de l'eau. Cependant, comme on le recommande dans le cadre des objectifs relatifs à la qualité de l'eau potable en Ontario, un contrôle bactériologique est effectué par l'exploitant. L'analyse bactériologique limitée du PSEP a révélé une eau de bonne qualité.

Les mesures des paramètres inorganiques et physiques étaient inférieures aux limites applicables fixées par l'Ontario pour l'eau potable.

Pour environ 110 paramètres organiques mesurés chaque mois, un seul résultat a dépassé les limites acceptables fixées pour la santé. En effet, 356,3 ug/L de trihalométhanes, dont le seuil a été établi à 350 ug/L, ont été observés dans un spécimen du réseau de distribution prélevé en juillet.

Un grand nombre de substances détectées apparaissent naturellement ou sont des produits dérivés de l'épuration.

Les résultats des analyses effectuées en 1987 dans le cadre du PSEP ont indiqué que la station d'épuration de Brantford donnait une eau de bonne qualité et que cette qualité se maintenait dans tout le réseau de distribution.

TABLE 1

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE BY SCAN (1987)

SCAN	RAW			TREATED			SITE 1			SITE 2			SITE 3		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	3	3	100	9	4	44	47	15	31	16	7	43	21	7	33
CHEMISTRY (FLD)	3	3	100	6	6	100	114	114	100	41	41	100	63	63	100
CHEMISTRY (LAB)	19	17	89	19	17	89	328	310	94	132	125	94	188	168	89
METALS	20	11	55	20	11	55	390	255	65	156	105	67	234	159	67
CHLOROAROMATICS	13	0	0	13	0	0	130	0	0	52	0	0	78	1	1
PAH	17	0	0	17	0	0	.	.	.	.	.	.	.	.	.
PESTICIDES & PCB	25	0	0	25	0	0	250	1	0	100	0	0	150	0	0
PHENOLICS	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
SPECIFIC PESTICIDES	9	0	0	9	0	0	90	1	1	36	0	0	54	0	0
VOLATILES	28	0	0	28	3	10	279	40	14	112	16	14	167	25	14
TOTAL	138	34		147	41		1628	736		645	294		955	423	

THE ODWO FOR TOTAL TRIHALOMETHANES WAS EXCEEDED IN ONE DISTRIBUTED WATER. NO OTHER HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED.

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE

A '.' INDICATES THAT NO SAMPLE WAS TAKEN

## DRINKING WATER SURVEILLANCE PROGRAM

### BRANTFORD WATER TREATMENT PLANT 1987 ANNUAL REPORT

#### INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP was initiated at the Brantford Water Treatment Plant in March of 1987.

#### PLANT DESCRIPTION

The Brantford Water Treatment Plant is a conventional treatment plant which treats water from the Grand River. The treatment process consists of coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation. Sodium silicate is added as a coagulant aid; powdered activated carbon is used for taste and odour control when required. This plant serves a population of approximately 75,000. It has a rated capacity of 90 x 1000m<sup>3</sup>/day and daily flows ranging from 41 x 1000m<sup>3</sup>/day to 57 x 1000m<sup>3</sup>/day.

The plant location is shown in Figure 1. Plant process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

#### METHODS

Water samples were obtained from five DWSP approved locations;

- i) Plant Raw - The water originated from the raw water wet well prior to chlorination and was sampled through stainless steel sample lines. The sample tap is located near the wet well.
- ii) Plant Treated - The water originated from the clear well after addition of all treatment chemicals and was sampled through stainless steel sample lines. The sample tap is located in the control room.
- iii) Distribution System - Site 1 - This house is approximately 1.7 kilometers from the plant. Water was sampled through a copper sample line at the kitchen tap.
- iv) Distribution System - Site 2 - This house is approximately 10 kilometers from the plant. Water was sampled through a copper sample line at the kitchen tap.
- v) Distribution System - Site 3 - This house is approximately 7.0 kilometers from the plant. Water was sampled through a copper sample line at the

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

SITE LOCATION MAP

LOCATION: BRANTFORD WATER TREATMENT PLANT

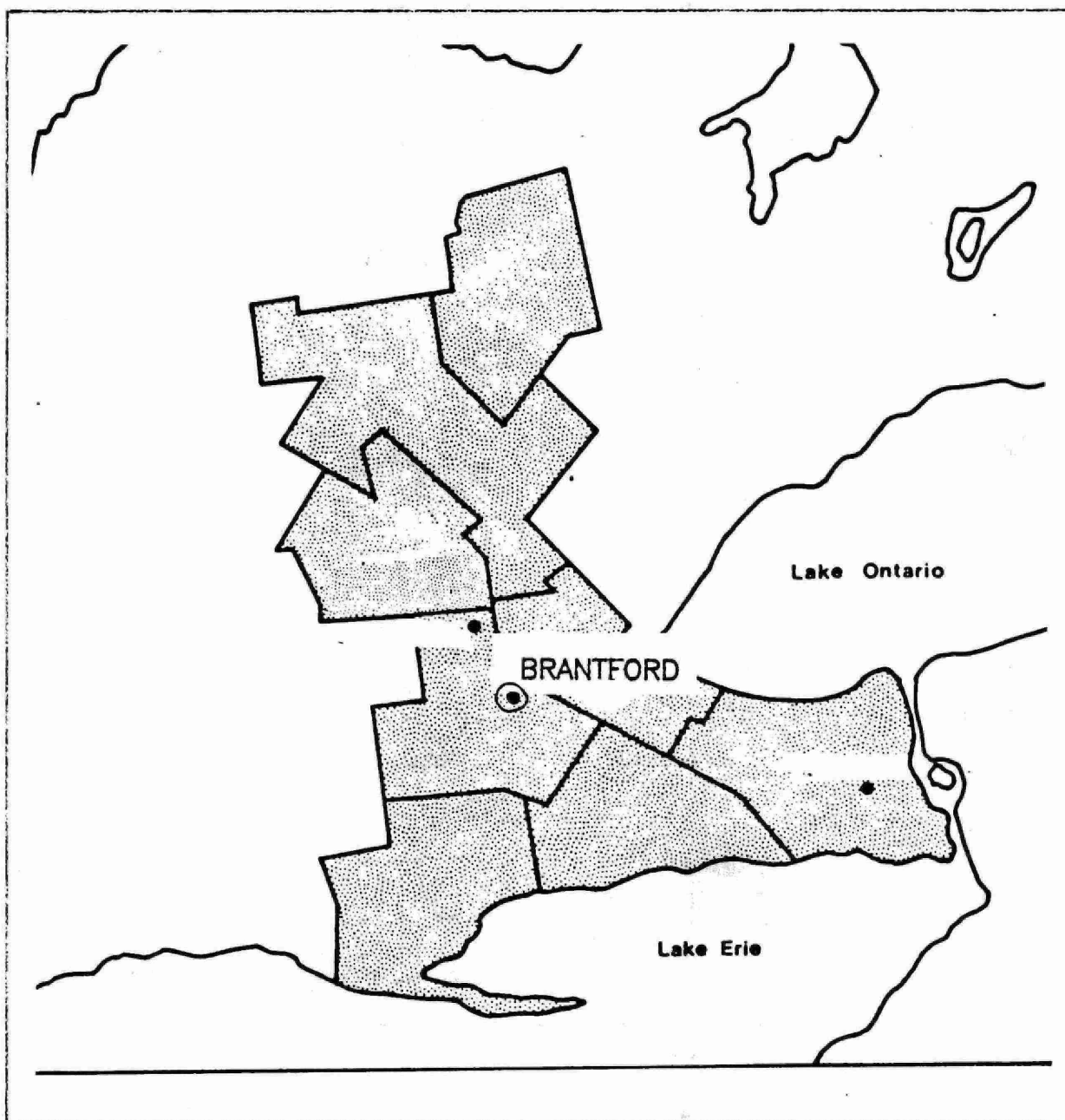


Figure 2

# BRANTFORD WATER TREATMENT PLANT GRAND RIVER VIA HOMEDALE CANAL

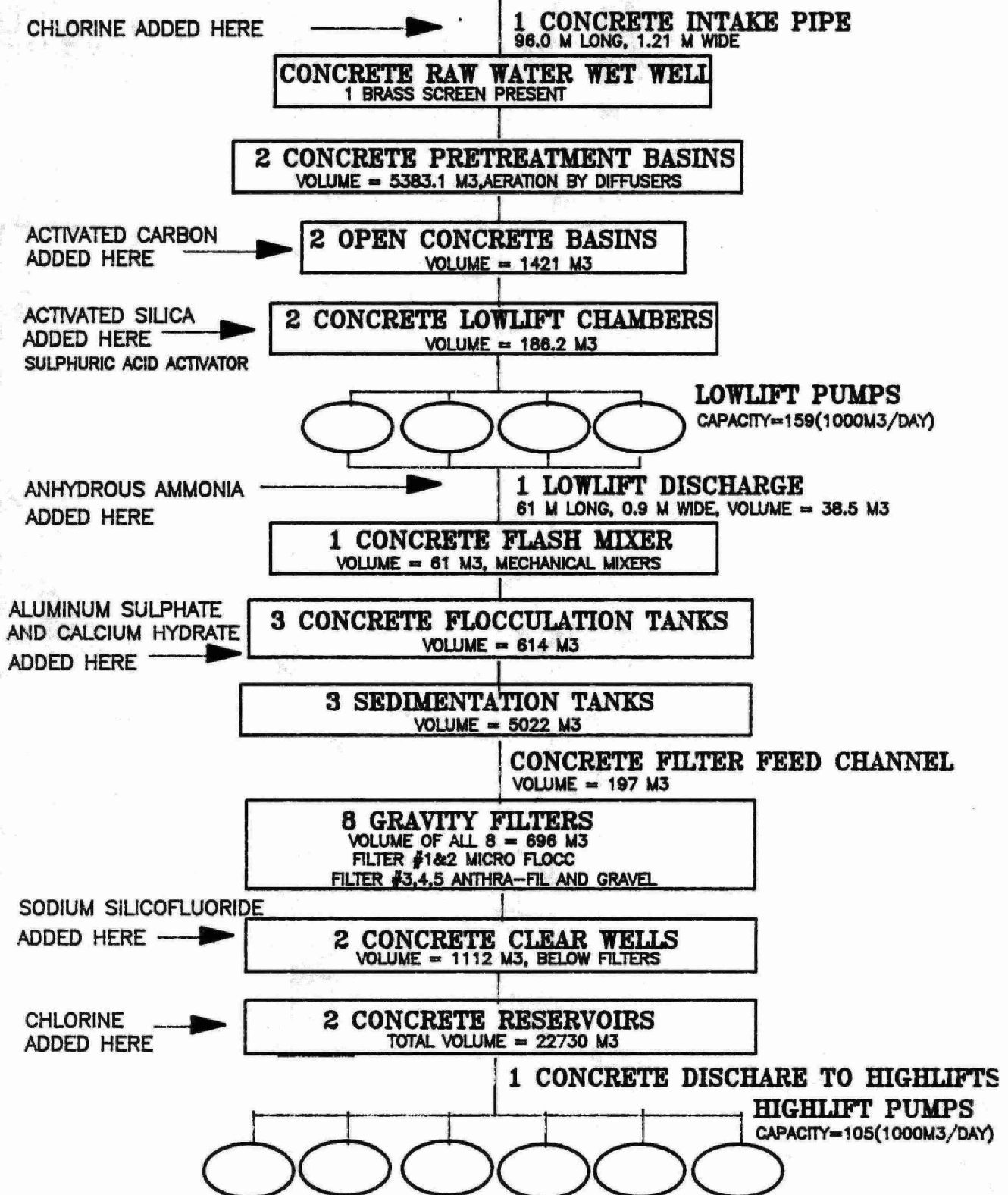


TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

BRANTFORD WATER SUPPLY SYSTEM

<u>LOCATION:</u>	324 GRAND RIVER AVENUE BRANTFORD, ONTARIO N3T 4Y8 (519-753-7391)
<u>SOURCE:</u>	RAW WATER SOURCE - GRAND RIVER VIA HOMEDALE CANAL
<u>RATED CAPACITY:</u>	104 (1000 M3/DAY)
<u>OPERATION:</u>	MUNICIPAL
<u>PLANT SUPERINTENDENT:</u>	F. SMITH
<u>MINISTRY REGION:</u>	WEST CENTRAL
<u>DISTRICT OFFICER:</u>	B. CREAMER

MUNICIPALITY  
SERVED

BRANTFORD  
WATERDOWN

POPULATION

75,081

kitchen tap.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At the distribution system location two types of samples were obtained: a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples are used to make an assessment of the amount by which the levels inorganic compounds and metals may be changed on standing due to leaching from (or deposition on) the plumbing system. The only analyses carried out on these samples therefore, are General Chemistry and Metals. The free flow sample represented fresh water from the distribution main that had been flowing for five minutes before the sample was taken.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the plant was five hours then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site

would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to eliminate any variance (Appendix B).

Sample day flow, treatment chemical dosages and Field Chemistry measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered on the DWSP data base as submitted.

### RESULTS

The Brantford Water Supply distribution system was sampled for approximately 160 parameters on a monthly basis beginning in March. The distribution system site 3 was discontinued in August and a new location was selected. Sampling of the plant raw and treated water was initiated in December after the sampling lines had been replaced in order to meet the DWSP requirements.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment

(MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters not detected.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

## DISCUSSION

### General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently initiated by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

As stated under Results, traces do not indicate quantifiable

values, as defined by established MOE Laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.

#### Bacteriology

Positive results for the Bacteriology scan were present four times in the treated water, fifteen times in the distribution system Site 1 water, seven times in the Site 2 water and seven times in the Site 3 water. The positive parameters were Standard Plate Count, Total Coliform and/or Total Coliform Background and Aeromonas. Aeromonas and Coliforms were detected by the Presence/Absence test in the July distribution system Site 1 sample. Total Coliforms were detected in the December treated water sample.

Standard Plate Count is a test used to supplement routine analysis for Coliform bacteria. The limit for Standard Plate Count (at 35 °C after 48 hours) in the ODWO is 500 organisms/mL based on a geometric mean of 5 or more samples. High Standard Plate Counts occurred four times at distribution system Site 3 and three times at Site 1. Substantial Total Chlorine Residuals were present but these samples were taken from May to September

when the temperature in the distribution system was high. The High Standard Plate Counts probably reflect increased bacteriological growth as a result of high temperatures.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water. Routine bacteriological monitoring as recommended in the ODWOs is carried out by the operating authority. Water from the Brantford Water Supply, in terms of the limited DWSP bacteriological examination, was of good quality although some deterioration was noticed during the summer months.

#### Inorganic and Physical

##### **Laboratory and Field Chemistry**

The results for Laboratory Chemistry and Field Chemistry scans were below applicable health related ODWOs.

There are ODWOs that are set for parameters which are related to aesthetic quality rather than health; one of these is Organic Nitrogen. Organic Nitrogen values are calculated by subtracting the value for Ammonia (Ammonium Total) from the value for Total Kjeldahl Nitrogen (Nitrogen Tot Kjeld). The aesthetic ODWO of 0.15 mg/L was exceeded in many of the treated water and distribution system samples. When Organic Nitrogen exceeds 0.15 mg/l in treated water some taste and odour problems can result.

This guideline is exceeded in most supplies. Based on the information obtained from the DWSP, which generally indicates no problems with this parameter exceedence, the guideline may be modified when the ODWOs are reviewed.

Colour values exceeded the aesthetic ODWO of 5 True Colour Units (TCU) in one treated water sample and eight free flow distribution system samples. Colour in drinking water may be due to the presence of natural or synthetic organic substances as well as certain metallic ions.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The desired ODWO was exceeded ten times in the treated water and the free flow distribution waters.

Hard water is undesirable because of a tendency to form scale deposits when heated and result in excessive soap consumption. High hardness values are usually associated with ground water sources. Hardness values in excess of 250 mg/L as CaCO<sub>3</sub> were present in the distribution system samples.

The European Economic Community (EEC) aesthetic guideline level for Conductivity was exceeded in all of the water samples, and

is a result of the high hardness levels.

The Maximum Desirable Concentration of 500 mg/L for Residue was exceeded in many of the distribution system water samples. High Residue values are also indicative of highly mineralized waters.

The water in the Grand River originates from Lake Conestoga and travels through limestone before it reaches the water treatment plant. This would explain the high hardness, conductivity and residue values for a source that is not a ground water.

As part of the treatment plant process Sodium Silicofluoride is added to the treated water (Table 3). Where fluoridation is practised, the Fluoride concentration recommended in the ODWO is 1.2 mg/L, plus or minus 0.2 mg/L. Maintenance of this level was inconsistent.

#### **Metals**

The results reported for the Metal scan were below any applicable health related ODWOs.

Elevated levels of Copper and Zinc were detected in the standing samples as compared to the free flow distribution samples, indicating that small quantities of these metals were leached from the household plumbing as the water stood overnight.

Elevated levels of Lead occurred in the standing samples from Site 2 and the source should be investigated.

At present, there is no evidence that Aluminum is physiologically harmful and no limit has been specified. The measure of residual Aluminum in the treated water is important to indicate efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 0.1 mg/L as Al in the water leaving the plant. Aluminum values exceeded the ODWO operational guideline thirteen times in all the treated waters.

Mercury levels in the raw and treated water samples were much higher in the April, May and June samples as compared to other months however the ODWO of 1.0 ug/L was not exceeded. Potassium dichromate, a preservative for mercury samples, has a limited shelf-life. As the preservative deteriorates Mercury levels increase as a result of interferences and the preservatives are replaced.

### Organic

#### **Chloroaromatics**

The results of the Chloroaromatics group showed that eight parameters were detected:

- Hexachlorobutadiene
- 1,2,3-Trichlorobenzene
- 1,2,3,5-Tetrachlorobenzene
- 1,2,4-Trichlorobenzene
- 1,3,5-Trichlorobenzene
- Hexachloroethane

2,3,6-Trichlorotoluene

2,6a-Trichlorotoluene

Hexachlorobutadiene was detected at a trace level, once in the distribution system Site 3 water.

1,2,3-Trichlorobenzene was detected once at a trace level, in the distribution system Site 3 water.

1,2,3,5-Tetrachlorobenzene was detected at 13 ng/L in the April distribution system Site 3 water. Although no drinking water limit exists for 1,2,3,5-Tetrachlorobenzene, the United States Environmental Protection Agency (EPA) has set an Ambient Water Quality (AWQ) guideline of 38000 ng/L for the more toxic 1,2,4,5-Tetrachlorobenzene. AWQ guidelines are designed to ensure that surface water, used as a source of drinking water and from which fish are consumed, does not contain substances at levels that would be hazardous to human health. Since both water and fish consumption are considered, AWQ guidelines are usually more stringent than any corresponding drinking water guideline. The positive occurrence was well below the AWQ guideline.

1,2,4-Trichlorobenzene was detected at trace levels, once in the distribution system Site 1 water and once in the Site 3 water.

1,3,5-Trichlorobenzene was detected at trace levels, twice in the distribution system Site 3 water.

Hexachloroethane was detected at trace levels, five times in the distribution system Site 1 water, once in the Site 2 water and four times in the Site 3 water.

2,3,6- Trichlorotoluene was detected once at a trace level, in the distribution system Site 1 water.

2,6a-Trichlorotoluene was detected at trace levels, once in the distribution system Site 1 water and twice in the Site 3 water.

Review of these results, along with information from other water supplies on DWSP, would indicate that certain Chloroaromatics appear more frequently in the treated water than in the raw and almost always at trace levels. These occurrences could possibly be due to a reaction of chlorine with organics present in the water or in the distribution system.

#### **Pesticides and PCB (Polychlorinated Biphenyl)**

Within the Pesticides and PCB scan five pesticides were detected:

Alpha BHC

Beta BHC

Lindane

Heptachlor

HCB

Lindane consists of several isomers of BHC (Benzene Hexachloride). Alpha BHC is the isomer most predominantly found in the Great Lakes basin as indicated in results from other water

supplies on DWSP.

Alpha BHC was detected at trace levels, six times in the distribution system Site 1 water, once in the Site 2 water and four times in the Site 3 water.

Beta BHC was detected at trace levels, once in the distribution system Site 1 water and twice in the Site 3 water.

Lindane was detected at trace levels, once in the raw water and treated water, nine times in the distribution system Site 1 water, four times in the Site 2 water and five times in the Site 3 water. A positive value of 11 ng/L was detected in the August Site 1 water. This value was below the ODWO of 4000 ng/L.

Heptachlor was detected at a trace level, once in the distribution system Site 1 water and Site 3 water.

HCB (Hexachlorobenzene) was detected at a trace level, once in the distribution system Site 3 water.

#### **Specific Pesticides**

Within the Specific Pesticide scan one pesticide was detected:

Atrazine

Atrazine was detected at trace levels, once in the raw water, once in the treated water, three times in the distribution system Site 1 water, twice in the Site 2 water and twice in the Site 3

water. The June Site 1 water had a value of 670 ng/L well below Health and Welfare Canada's Interim Maximum Acceptable Concentration (MAC) of 60000 ng/L.

#### **Phenolics**

Phenolic compounds were detected at trace levels, once in the raw water and once in the treated water. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

#### **Polynuclear Aromatic Hydrocarbons (PAH)**

The results of the PAH scan showed that one was detected:

Benzo(B) Fluoranthene

Benzo(B) Fluoranthene was detected at a trace level, once in the raw water. PAHs have a close association with suspended solids and removal of turbidity by conventional treatment will achieve maximal PAH reduction.

#### **Volatiles**

Within the Volatile scan eight parameters, other than Trihalomethanes (THMs), were detected:

Benzene

Toluene

Ethylbenzene

Para and Meta-Xylene

Ortho-Xylene

1,1-Dichloroethane

1,1,1-Trichloroethane

Tetrachloroethylene

Benzene was detected at trace levels, twice in the distribution system Site 1 water and once in the Site 3 water.

Toluene was detected at trace levels, once in the distribution system Site 1 water and Site 2 water and twice in the Site 3 water. The November Site 1 and 2 values were considered unreliable due to contamination as per the remark 'UCS'. The April Site 1 and Site 3 water samples had positive values of 2.0 and 1.0 ug/L. These values are below the California State Department of Health Guideline Value for drinking water of 100 ug/L. Subsequent to the development of Table 5, Health and Welfare Canada have published an Aesthetic Objective (AO) for Toluene in drinking water of 24 ug/L. An AO is set at a value below those that could be derived based on health considerations.

Ethylbenzene was detected at trace levels, three times in the distribution system Site 1 water and once in the Site 3 water.

Para and Meta-Xylene are measured as one compound, M-Xylene and were detected at trace levels, once in the distribution system Site 1 and Site 3 waters.

Ortho-Xylene (O-Xylene) was detected at trace levels, once in both the distribution system Site 1 and Site 3 waters.

These volatiles are typically found on an occasional basis at other water supplies included on the DWSP, usually at trace levels.

1,1-Dichloroethane was detected at trace levels, three times in the distribution system Site 1 water and once in the Site 3 water. The April Site 3 water had a value of 1.0 ug/L. No known guidelines or limits exist for this volatile.

1,1,1-Trichloroethane was detected at trace levels, once in the distribution system Site 1 and Site 3 waters.

Tetrachloroethylene was detected at trace levels, once in the distribution system Site 1 and Site 3 waters.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised mainly of Chloroform, Chlorodibromomethane and Dichlorobromomethane with Bromoform occurring occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were always detected in treated water. Bromoform was not detected. All THM occurrences were below the ODWO of 350 ug/L for Total THMs with the exception of the July distribution system Site 1 sample which had a level of 356.3 ug/L.

## CONCLUSIONS

The Brantford Water Treatment Plant for the sample year of 1987 produced good quality water at the plant and this was maintained throughout the distribution system.

No health related guidelines for inorganic parameters, were exceeded during 1987.

## RECOMMENDATIONS

Four recommendations can be made:

- 1) The data base should be reviewed in consultation with Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed could be altered to allow for a more efficient characterization of the water.
- 2) Fluoridation practises should be adjusted to maintain the recommended fluoride levels in the distributed water.
- 3) The reason for elevated Lead levels in the standing water from distribution system Site 2 should be investigated.
- 4) TTHM levels should be closely monitored.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SAMPLE DAY CONDITIONS

## TREATMENT CHEMICAL DOSAGES (MG/L)

RETENTION TIME(HRS)	FLOW (1000M3)	PRE-CHLORINATION	CHLORAMINATION	COAGULATION	COAGULATION AID	ACTIVATION	FLUORIDATION	DECHLORINATION	POST-CHLORINATION
		CHLORINE	AMMONIUM ANHYDROUS	ALUM LIQUID	SODIUM SILICATE	SULPHURIC ACID	SODIUM SILICOFLUORID	SULPHUR DIOXIDE	CHLORINE
4.0	43.3	7.64	.44	35.00	7.50	3.14	1.00	.	.06
4.0	49.3	9.95	.80	35.00	7.00	1.30	1.00	.36	.10
3.5	48.7	9.69	.88	35.00	7.50	3.73	1.00	.02	.
4.0	41.9	10.80	.47	35.00	8.00	4.90	1.00	.06	.06
3.0	46.3	11.40	.65	35.00	6.50	3.30	1.00	.	.47
3.0	53.9	8.91	.30	35.00	7.00	1.50	1.00	.	.
3.0	48.0	9.08	.32	35.00	6.00	.	1.00	.23	.
3.0	46.1	8.67	.39	30.00	5.00	.	1.00	.	.
4.5	46.1	9.91	.49	25.00	6.00	.	1.00	.	.
5.7	56.6	8.72	.43	35.00	6.00	2.75	1.00	.04	.

Dosages were only available for PAC in July(5 mg/L) and for calcium hydroxide for post pH adjustment in March( 2.87 mg/L)

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
BACTERIOLOGICAL	AEROMONAS SP	.	.	.	1	0	0	2	1	0	.	.	.	.	.	.
	COLIFORM	.	.	.	1	0	0	2	1	0	.	.	.	.	.	.
	ESCHERICHIA COLI BY PRESENCE/ABSENCE	.	.	.	1	0	0	2	0	0	.	.	.	.	.	.
	FECAL COLIFORM	.	.	.	1	0	0	2	0	0	.	.	.	.	.	.
	FECAL COLIFORM MEMBRANE FILTRATION	1	1	0	.	.	.	.	.	.	.	.	.	.	.	.
	P/A BOTTLE	.	.	.	1	1	0	10	2	0	4	0	0	6	0	0
	STANDARD PLATE COUNT MEMBRANE FILT.	0	0	0	1	1	0	9	9	0	4	4	0	5	5	0
	STAPH AUREUS	.	.	.	1	0	0	2	0	0	.	.	.	.	.	.
	TOTAL COLIFORM BACKGROUND MF	1	1	0	1	1	0	9	2	0	4	3	0	5	2	0
	TOTAL COLIFORM MEMBRANE FILTRATION	1	1	0	1	1	0	9	0	0	4	0	0	5	0	0
*TOTAL SCAN BACTERIOLOGICAL		3	3	0	9	4	0	47	15	0	16	7	0	21	7	0
*TOTAL GROUP BACTERIOLOGICAL		3	3	0	9	4	0	47	15	0	16	7	0	21	7	0
CHEMISTRY (FLD)	FIELD COMBINED CHLORINE RESIDUAL	.	.	.	1	1	0	19	19	0	8	8	0	12	12	0
	FIELD FREE CHLORINE RESIDUAL	.	.	.	1	1	0	15	15	0	1	1	0	3	3	0
	FIELD PH	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	FIELD TEMPERATURE	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	FIELD TOTAL CHLORINE RESIDUAL	.	.	.	1	1	0	20	20	0	8	8	0	12	12	0
	FIELD TURBIDITY	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
*TOTAL SCAN CHEMISTRY (FLD)		3	3	0	6	6	0	114	114	0	41	41	0	63	63	0
CHEMISTRY (LAB)	ALKALINITY	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE						SITE 1			SITE 2			SITE 3		
		TOTAL	RAW POSITIVE	TRACE	TOTAL	TREATED POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	AMMONIUM TOTAL	1	0	0	1	1	0	20	17	3	8	6	1	12	9	3
	CALCIUM	1	1	0	1	1	0	20	20	0	8	8	0	12	8	4
	CHLORIDE	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	COLOUR	1	1	0	1	1	0	20	20	0	8	8	0	12	11	1
	CONDUCTIVITY	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	CYANIDE	1	0	0	1	0	0	10	0	0	4	0	1	6	0	0
	FLUORIDE	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	HARDNESS	1	1	0	1	1	0	20	20	0	8	8	0	8	8	0
	MAGNESIUM	1	1	0	1	1	0	20	20	0	8	8	0	12	8	3
	NITRITE	1	1	0	1	0	1	19	14	5	8	7	1	11	9	1
	NITROGEN TOTAL KJELDAHL	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	PH	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	PHOSPHORUS FIL REACT	1	1	0	1	1	0	.	.	.	.	.	.	.	.	.
	PHOSPHORUS TOTAL	1	1	0	1	1	0	.	.	.	.	.	.	.	.	.
	SODIUM	1	1	0	1	1	0	20	20	0	8	8	0	8	8	0
	TOTAL NITRATES	1	1	0	1	1	0	19	19	0	8	8	0	11	11	0
	TOTAL SOLIDS	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	TURBIDITY	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
*TOTAL SCAN CHEMISTRY (LAB)		19	17	0	19	17	1	328	310	8	132	125	3	188	168	12
METALS	ALUMINUM	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	ARSENIC	1	0	0	1	0	0	20	0	0	8	0	0	12	0	0
	BARIUM	1	1	0	1	1	0	20	20	0	8	8	0	12	8	0

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE														
		RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	1	0	0	1	0	0	20	1	0	8	0	0	12	0	0
	BORON	1	0	1	1	0	1	20	18	2	8	8	0	12	9	1
	CADMIUM	1	0	0	1	0	0	20	1	0	8	0	0	12	1	0
	CHROMIUM	1	1	0	1	1	0	20	11	0	8	8	0	12	4	0
	COBALT	1	0	0	1	0	0	20	11	0	8	0	0	12	12	0
	COPPER	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	IRON	1	1	0	1	1	0	20	17	0	8	8	0	12	10	0
	LEAD	1	0	0	1	0	0	20	8	0	8	6	0	12	8	0
	MANGANESE	1	1	0	1	1	0	20	20	0	8	8	0	12	10	0
	MERCURY	1	0	0	1	0	0	10	8	0	4	4	0	6	5	0
	MOLYBDENUM	1	0	0	1	0	0	20	12	0	8	5	0	12	10	0
	NICKEL	1	1	0	1	1	0	20	17	0	8	8	0	12	10	0
	SELENIUM	1	0	0	1	0	0	20	0	0	8	0	0	12	0	0
	STRONTIUM	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	URANIUM	1	1	0	1	1	0	20	20	0	8	8	0	12	12	0
	VANADIUM	1	1	0	1	1	0	20	13	0	8	2	0	12	12	0
	ZINC	1	1	0	1	1	0	20	18	0	8	8	0	12	12	0
*TOTAL SCAN METALS		20	11	1	20	11	1	390	255	2	156	105	0	234	159	1
*TOTAL GROUP INORGANIC & PHYSICAL		42	31	1	45	34	2	832	679	10	329	271	3	485	390	13
CHLOROAROMATICS	123 TRICHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	1
	1234 TETRACHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	1235 TETRACHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	1	0

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROAROMATICS	124 TRICHLOROBENZENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	1
	1245 TETRACHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	135 TRICHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	2
	236 TRICHLOROTOLUENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	0
	245 TRICHLOROTOLUENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	26A TRICHLOROTOLUENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	2
	HEXACHLOROBUTADIENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	1
	HEXACHLOROETHANE	1	0	0	1	0	0	10	0	5	4	0	1	6	0	4
	OCTACHLOROSTYRENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	PENTACHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
*TOTAL SCAN CHLOROAROMATICS		13	0	0	13	0	0	130	0	8	52	0	1	78	1	11
PESTICIDES & PCB	ALACHLOR	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ALDRIN	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ALPHA BHC	1	0	0	1	0	0	10	0	6	4	0	1	6	0	4
	ALPHA CHLORDANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ATRATONE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	BETA BHC	1	0	0	1	0	0	10	0	1	4	0	0	6	0	2
	DICHLORODIPHENYLDICHLOROETHANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	DIELDRIN	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ENDRIN	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ETHYLENE DIBROMIDE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	GAMMA CHLORDANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SITE

[illegible]

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE						SITE 1			SITE 2			SITE 3		
		RAW	TREATED													
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
POLYAROMATIC HYDROC	BENZO(A) ANTHRACENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO (A) PYRENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO(B) CHRYSENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO(B) FLUORANTHENE	1	0	1	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO(E)PYRENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO(G,H,I) PERYLENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	BENZO(J) FLUORANTHENE	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	BENZO(K) FLUORANTHENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	CHRYSENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	CORONENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	DIBENZO(A,H) ANTHRACENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	DIMETHYL BENZO(A) ANTHRACENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	FLUORANTHENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	INDENO(1,2,3-C,D) PYRENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PERYLENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PHENANTHRENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PYRENE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
*TOTAL SCAN POLYAROMATIC HYDROC		17	0	1	17	0	0	0	0	0	0	0	0	0	0	0
SPECIFIC PESTICIDES	AMETRYNE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	ATRAZINE	1	0	1	1	0	1	10	1	3	4	0	2	6	0	2
	BLADEX	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	METOLACHLOR	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
SPECIFIC PESTICIDES	PROMETONE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	PROMETRYNE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	PROPAZINE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	SENCOR	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	SIMAZINE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	TOXAPHENE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
*TOTAL SCAN SPECIFIC PESTICIDES		9	0	1	9	0	1	90	1	3	36	0	2	54	0	2			
VOLATILES	1,1 DICHLOROETHANE	1	0	0	1	0	0	10	0	3	4	0	0	6	1	1			
	1,1 DICHLOROETHYLENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1,2 DICHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1,2 DICHLOROETHANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1,2 DICHLOROPROPANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1,3 DICHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1,4 DICHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	111, TRICHLOROETHANE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	1			
	112 TRICHLOROETHANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	1122 TETRA-CHLOROETHANE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	BENZENE	1	0	0	1	0	0	10	0	2	4	0	0	6	0	1			
	BROMOFORM	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	CARBON TETRACHLORIDE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	CHLOROBENZENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0			
	CHLORODIBROMOMETHANE	1	0	0	1	0	1	10	8	1	4	3	1	6	5	0			

TABLE 4

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P.

## SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			TREATED			SITE 1			SITE 2			SITE 3		
		RAW	TOTAL POSITIVE TRACE		RAW	TOTAL POSITIVE TRACE		RAW	TOTAL POSITIVE TRACE		RAW	TOTAL POSITIVE TRACE		RAW	TOTAL POSITIVE TRACE	
VOLATILES	CHLOROFORM	1	0	0	1	1	0	10	10	0	4	4	0	6	6	0
	DICHLOROBROMOMETHANE	1	0	0	1	1	0	10	10	0	4	4	0	6	6	0
	ETHYLBENZENE	1	0	0	1	0	0	10	0	3	4	0	0	6	0	1
	M-XYLENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	METHYLENE CHLORIDE	1	0	0	1	0	0	9	0	0	4	0	0	5	0	0
	O-XYLENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	1
	P-XYLENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	1
	TETRACHLOROETHYLENE	1	0	0	1	0	0	10	0	1	4	0	0	6	0	1
	TOLUENE	1	0	0	1	0	0	10	2	1	4	1	1	6	1	2
	TOTAL TRIHALOMETHANES	1	0	0	1	1	0	10	10	0	4	4	0	6	6	0
	TRANS 1,2 DICHLOROETHYLENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	TRICHLOROETHYLENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
	TRIFLUOROCHLOROTOLUENE	1	0	0	1	0	0	10	0	0	4	0	0	6	0	0
*TOTAL SCAN VOLATILES		28	0	0	28	3	1	279	40	14	112	16	2	167	25	9
*TOTAL GROUP ORGANIC		93	0	4	93	3	4	749	42	42	300	16	10	449	26	35
TOTAL		138	34	5	147	41	6	1628	736	52	645	294	13	955	423	48

## KEY TO TABLES 5 AND 6

- A      ONTARIO DRINKING WATER OBJECTIVES
1. Maximum Acceptable Concentration (MAC)
  - 1+. MAC for Total Trihalomethanes
  - 1\*. MAC for Bacteriological Analyses
- Poor water quality is indicated when :
- total coliform counts  $> 0 < 5$
  - P/A Bottle Test is present after 48 hours
  - Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
  - Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
  - Standard Plate Count should not exceed 500 organisms per ml at 35 deg C within 48 hours
2. Interim Maximum Acceptable Concentration (IMAC)
  3. Maximum Desirable Concentration (MDC)
  4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness  $> 200$  mg/L are considered poor and those in excess of 500 mg/L are unacceptable.
- B      HEALTH & WELFARE CANADA
1. Maximum Acceptable Concentration (MAC)
  2. Proposed MAC
  3. Interim MAC
- C      WORLD HEALTH ORGANIZATION
1. Guideline Value (GV)
  2. Tentative GV
  3. Aesthetic GV
- D      US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
  2. Suggested No-Adverse Effect Level (SNAEL)
  3. Lifetime Health Advisory
  4. EPA Ambient Water Quality Criteria
- F      EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
  2. Aesthetic Guideline Level
  3. Maximum Admissable Concentration (MADC)
- G      CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- H      USSR MAXIMUM PERMISSIBLE CONCENTRATION
- I      NEW YORK STATE AMBIENT WATER GUIDELINE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample

RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

RAW

TREATED

SITE 1

SITE 2

SITE 3

STANDING

FREE FLOW

STANDING

FREE FLOW

STANDING

FREE FLOW

## BACTERIOLOGICAL

AEROMONAS SP (0=ABSENT )

DET'N LIMIT = N/A

GUIDELINE = 0 (A1)

MAR

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JUL

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DEC

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E. COLI (P/A) (0=ABSENT )

DET'N LIMIT = N/A

GUIDELINE =

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JUL

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DEC

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FECAL COLIFORM MF (CT/100ML )

DET'N LIMIT = 0

GUIDELINE = 0 (A1)

DEC

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FECAL COLIFORM (0=ABSENT )

DET'N LIMIT = N/A

GUIDELINE = 0 (A1)

MAR

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JUL

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DEC

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STANDRD PLATE CNT MF (CT/ML )

DET'N LIMIT = 0

GUIDELINE = 500/ML (A1)

MAR

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APR

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DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
TYPE			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
	.	.	.	2400 >	.	.	.	2400 >
	.	.	.	2400 >	.	.	.	2400 >
	.	.	.	180	.	.	.	1500
	.	.	.	2400 >	.	3	.	.
	.	.	.	13	.	550	.	.
	.	.	.	1	.	95	.	.
IOP	27	.	.	11	.	38	.	.
<hr/>								
SENT )			DET'N LIMIT = 0		GUIDELINE = 0 (A1*)			
	.	.	.	1	.	.	.	0
	.	.	.	0	.	.	.	0
	.	.	.	0	.	.	.	0
	.	.	.	0	.	.	.	0
	.	.	.	1	.	.	.	0
	.	.	.	0	.	.	.	0
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	.	.	.	0	.	0	.	.
	.	1	.	0	.	0	.	.
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ABSENT )			DET'N LIMIT = N/A		GUIDELINE = 0 (A1)			
	.	.	.	0	.	.	.	.
	.	.	.	0	.	.	.	.
	.	0	.	.	.	.	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM					
SITE	RAW	TREATED	SITE 1	SITE 2		SITE 3			
TYPE				STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
COLIFORM (0=ABSENT )			DET'N LIMIT = N/A		GUIDELINE = 0 (A1)				
MAR	.	.	.	0	.	.	.	.	.
JUL	.	.	.	1	.	.	.	.	.
DEC	.	0	.	.	.	.	.	.	.
TOTAL COLIFORM MF (CT/100ML )			DET'N LIMIT = 0		GUIDELINE = 5/100ML(A1)				
MAR	.	.	.	0	.	.	.	.	0
APR	.	.	.	1LA	.	.	.	.	1LA
MAY	.	.	.	0	.	.	.	.	0
JUN	.	.	.	0	.	.	.	.	0
JUL	.	.	.	0	.	.	.	.	0
AUG	.	.	.	0	.	.	.	.	0
SEP	.	.	.	0	.	0	.	.	.
OCT	.	.	.	0	.	0	.	.	.
NOV	.	.	.	0	.	0	.	.	.
DEC	4200 A3C	1	.	0	.	0	.	.	.
T COLIFORM BCKGRD MF (CT/100ML )			DET'N LIMIT = 0		GUIDELINE = N/A				
MAR	.	.	.	0	.	.	.	.	0
APR	.	.	.	1LA	.	.	.	.	1LA
MAY	.	.	.	0	.	.	.	.	0
JUN	.	.	.	0	.	.	.	.	2400 >
JUL	.	.	.	2400 >	.	.	.	.	2400 >
AUG	.	.	.	0	.	.	.	.	0
SEP	.	.	.	1700	.	0	.	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
OCT	.	.	.	0	.	360	.	.
NOV	.	.	.	0	.	60	.	.
DEC	30000	4	.	0	.	162	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
CHEMISTRY (FLD)								
FLD CHLORINE (COMB) (MG/L )			DET'N LIMIT = N/A		GUIDELINE =		N/A	
MAR	.	.	.	1.100	.	.	.600	.550
APR	.	.	.750	.900	.	.	.100	.600
MAY	.	.	.800	.900	.	.	.300	.450
JUN	.	.	.600	.500	.	.	.300	.200
JUL	.	.	.400	.550	.	.	.300	.450
AUG	.	.	.700	.750	.	.	.200	.350
SEP	.	.	.800	1.000	.150	.300	.	.
OCT	.	.	.600	.850	.200	.300	.	.
NOV	.	.	.600	.800	.200	.300	.	.
DEC	.	.100	.600	.800	.150	.200	.	.
FLD CHLORINE FREE (MG/L )								
			DET'N LIMIT = N/A		GUIDELINE =		N/A	
APR	.	.	.100	.200	.	.	.	.
MAY	.	.	.150	.300	.	.	.	.300
JUN	.	.	.	.400	.	.	.	.200
JUL	.	.	.100	.100	.	.	.	.
AUG	.	.	.300	.350	.	.	.	.050
SEP	.	.	.	.200	.	.	.	.
OCT	.	.	.	.150	.	.	.	.
NOV	.	.	.100	.200	.	.	.	.
DEC	.	1.100	.100	.100	.	.100	.	.
TOTAL CHLORINE (MG/L )								
			DET'N LIMIT = N/A		GUIDELINE =		N/A	
MAR	.	.	1.000	1.100	.	.	.600	.550

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

SITE  
TYPE

RAW

TREATED

SITE 1

SITE 2

SITE 3

STANDING

FREE FLOW

STANDING

FREE FLOW

STANDING

FREE FLOW

APR	.	.	.850	1.100	.	.	.100	.600
MAY	.	.	.950	1.200	.	.	.300	.750
JUN	.	.	.600	.900	.	.	.300	.400
JUL	.	.	.400	.550	.	.	.300	.450
AUG	.	.	1.000	1.100	.	.	.200	.400
SEP	.	.	.800	1.200	.150	.300	.	.
OCT	.	.	.600	1.000	.200	.300	.	.
NOV	.	.	.700	1.000	.200	.300	.	.
DEC	.	1.200	.700	.900	.150	.300	.	.

FLD PH (DMSNLESS )

DET'N LIMIT = N/A

GUIDELINE =

N/A

MAR	.	.	7.750	7.750	.	.	7.600	7.600
APR	.	.	7.800	7.750	.	.	7.700	7.700
MAY	.	.	7.700	7.700	.	.	7.700	7.700
JUN	.	.	7.700	7.800	.	.	7.700	7.700
JUL	.	.	7.700	7.700	.	.	7.700	7.700
AUG	.	.	7.800	7.900	.	.	7.300	7.600
SEP	.	.	7.700	7.700	7.600	7.650	.	.
OCT	.	.	7.700	7.750	7.500	7.550	.	.
NOV	.	.	7.600	7.700	7.500	7.700	.	.
DEC	7.900	7.550	7.800	7.700	7.600	7.700	.	.

TEMPERATURE (DEG.C )

DET'N LIMIT = N/A

GUIDELINE =

N/A

MAR	.	.	10.000	7.900	.	.	16.000	7.000
APR	.	.	14.000	13.000	.	.	18.000	12.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.	.	16.000	16.500	.	.	18.000	16.000
JUN	.	.	23.000	21.500	.	.	22.000	21.300
JUL	.	.	20.000	24.000	.	.	24.000	24.000
AUG	.	.	22.000	21.000	.	.	21.500	21.000
SEP	.	.	18.000	17.500	19.000	18.000	.	.
OCT	.	.	15.000	11.500	18.500	14.500	.	.
NOV	.	.	13.500	7.000	18.000	11.500	.	.
DEC	3.500	3.500	13.000	6.500	12.000	10.000	.	.
FLD TURBIDITY (FTU )                      DET'N LIMIT = N/A                      GUIDELINE =								
MAR	.	.	.210	.120	.	.	.140	.110
APR	.	.	.150	.170	.	.	.220	.140
MAY	.	.	.260	.180	.	.	.240	.170
JUN	.	.	.320	.330	.	.	.340	.350
JUL	.	.	.260	.270	.	.	.250	.250
AUG	.	.	.140	.150	.	.	.190	.150
SEP	.	.	.130	.130	.280	.180	.	.
OCT	.	.	.100	.100	.150	.110	.	.
NOV	.	.	.110	.140	.090	.060	.	.
DEC	15.000	.370	.130	.110	.320	.280	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

## CHEMISTRY (LAB)

ALKALINITY (MG/L )		DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)				
MAR	.	.	194.500	193.300	.	.	192.600	192.600
APR	.	.	193.800	196.500	.	.	194.400	195.600
MAY	.	.	195.900	196.600	.	.	200.300	198.900
JUN	.	.	177.000	176.000	.	.	176.600	174.400
JUL	.	.	150.900	158.500	.	.	148.900	147.600
AUG	.	.	170.000	171.900	.	.	159.900	164.800
SEP	.	.	193.100	191.200	192.100	192.800	.	.
OCT	.	.	183.300	185.600	194.900	195.400	.	.
NOV	.	.	218.100	216.300	213.000	211.100	.	.
DEC	218.600	203.800	200.400	201.000	208.700	205.800	.	.

CALCIUM (MG/L )		DET'N LIMIT = .100		GUIDELINE = 100. (F2)				
MAR	.	.	74.900	75.200	.	.	.500 <T	.300 <T
APR	.	.	78.100	75.500	.	.	.700 <T	.300 <T
MAY	.	.	84.200	83.000	.	.	84.000	83.400
JUN	.	.	78.000	77.800	.	.	78.400	78.200
JUL	.	.	69.600	71.200	.	.	66.000	66.000
AUG	.	.	72.800	74.400	.	.	69.400	73.200
SEP	.	.	83.400	82.200	81.200	82.400	.	.
OCT	.	.	76.600	78.400	85.200	86.000	.	.
NOV	.	.	96.600	96.200	96.400	94.800	.	.
DEC	80.200	82.600	82.700	84.800	90.800	91.000	.	.

CYANIDE (MG/L )		DET'N LIMIT = 0.001		GUIDELINE = .200 (A1)				
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TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	.002 <T	.	.
CHLORIDE (MG/L )								
			DET'N LIMIT = .200		GUIDELINE = 250.0 (A3)			
MAR	.	.	33.500	34.000	.	.	34.000	34.000
APR	.	.	67.500	68.500	.	.	68.500	66.500
MAY	.	.	75.000	73.500	.	.	76.000	74.500
JUN	.	.	70.500	71.000	.	.	71.000	70.500
JUL	.	.	54.000	53.500	.	.	57.000	56.500
AUG	.	.	75.000	75.000	.	.	74.000	75.500
SEP	.	.	73.000	73.500	69.500	69.500	.	.
OCT	.	.	60.100	56.700	74.500	74.500	.	.
NOV	.	.	74.200	75.200	75.900	75.600	.	.
DEC	35.000	43.300	43.800	44.500	56.100	53.500	.	.
COLOUR (TCU )								
			DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)			
MAR	.	.	6.500	5.500	.	.	6.000	5.500

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
APR	.	.	5.500	5.500	.	.	6.000	5.500
MAY	.	.	3.000	3.500	.	.	3.000	2.500 <T
JUN	.	.	5.500	5.500	.	.	5.500	5.500
JUL	.	.	6.500	7.000	.	.	6.000	6.000
AUG	.	.	4.000	4.000	.	.	4.000	4.000
SEP	.	.	4.500	4.000	5.000	5.000	.	.
OCT	.	.	4.000	4.500	4.500	4.500	.	.
NOV	.	.	3.500	3.000	4.000	4.500	.	.
DEC	22.500	7.500	8.000	7.000	7.000	7.500	.	.
CONDUCTIVITY (UMHO/CM )      DET'N LIMIT = 1      GUIDELINE = 400.      (F2)								
MAR	.	.	578	581	.	.	598	599
APR	.	.	721	717	.	.	791	767
MAY	.	.	806	804	.	.	789	810
JUN	.	.	746	740	.	.	741	739
JUL	.	.	597	611	.	.	598	600
AUG	.	.	763	766	.	.	752	762
SEP	.	.	774	780	749	756	.	.
OCT	.	.	687	674	777	783	.	.
NOV	.	.	834	839	844	838	.	.
DEC	611	643	653	652	707	696	.	.
FLUORIDE (MG/L )      DET'N LIMIT = .01      GUIDELINE = 2.400      (A1)								
MAR	.	.	.600	.470	.	.	.680	.670
APR	.	.	.980	1.070	.	.	.910	.980

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.	.	.970	.900	.	.	1.160	1.040
JUN	.	.	1.470	1.530	.	.	1.320	1.390
JUL	.	.	1.200	1.300	.	.	1.000	1.100
AUG	.	.	1.220	1.160	.	.	.940	1.080
SEP	.	.	.600	.620	.700	.720	.	.
OCT	.	.	.980	1.140	1.040	1.040	.	.
NOV	.	.	.860	.980	1.040	1.060	.	.
DEC	.100	.800	1.060	1.160	1.220	1.260	.	.
<hr/>								
HARDNESS (MG/L )			DET'N LIMIT = .500		GUIDELINE = 80-100 (A4)			
MAR	.	.	263.000	264.500	.	.	.	.
APR	.	.	295.000	288.000	.	.	.	.
MAY	.	.	311.000	307.000	.	.	309.000	309.000
JUN	.	.	290.000	289.000	.	.	292.000	291.000
JUL	.	.	248.000	253.000	.	.	240.000	238.000
AUG	.	.	278.000	284.000	.	.	269.000	278.000
SEP	.	.	312.000	308.000	299.000	303.000	.	.
OCT	.	.	283.000	286.000	316.000	319.000	.	.
NOV	.	.	350.000	349.000	350.000	343.000	.	.
DEC	286.000	291.000	292.000	298.000	321.000	320.000	.	.
<hr/>								
MAGNESIUM (MG/L )			DET'N LIMIT = .050		GUIDELINE = 30. (F2)			
MAR	.	.	18.400	18.600	.	.	.300 <T	BDL
APR	.	.	24.300	24.200	.	.	.400 <T	.200 <T
MAY	.	.	24.400	24.100	.	.	24.200	24.400

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	23.200	23.000	.	.	23.300	23.400
JUL	.	.	18.000	18.200	.	.	18.200	17.700
AUG	.	.	23.400	23.900	.	.	23.200	23.000
SEP	.	.	25.300	25.000	23.400	23.600	.	.
OCT	.	.	22.300	22.000	25.100	25.200	.	.
NOV	.	.	26.300	26.400	26.600	25.900	.	.
DEC	20.700	20.600	20.800	20.900	22.800	22.400	.	.
SODIUM (MG/L )								
			DET'N LIMIT = .200		GUIDELINE = 200. (C3)			
MAR	.	.	16.700	16.700	.	.	.	.
APR	.	.	35.600	35.600	.	.	.	.
MAY	.	.	45.800	46.200	.	.	48.600	46.800
JUN	.	.	40.400	40.800	.	.	40.600	40.600
JUL	.	.	27.600	27.600	.	.	29.800	28.600
AUG	.	.	46.000	45.600	.	.	45.800	45.800
SEP	.	.	44.400	44.600	42.200	42.800	.	.
OCT	.	.	35.600	33.400	48.200	48.800	.	.
NOV	.	.	41.800	43.400	45.800	45.000	.	.
DEC	21.300	23.700	24.100	23.000	30.400	28.200	.	.
AMMONIUM TOTAL (MG/L )								
			DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)			
MAR	.	.	.262	.294	.	.	.024	.026
APR	.	.	.358	.334	.	.	.088	.152
MAY	.	.	.334	.312	.	.	.174	.322
JUN	.	.	.024	.074	.	.	.044	.054

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
-----								
JUL	.	.	.008 <T	.010	.	.	.008 <T	.004 <T
AUG	.	.	.002 <T	.002 <T	.	.	.010	.002 <T
SEP	.	.	.216	.416	.022	.014	.	.
OCT	.	.	.240	.310	.008 <T	.040	.	.
NOV	.	.	.272	.304	.038	.068	.	.
DEC	BDL	.392	.304	.354	.032	BDL	.	.
-----								
NITRITE (MG/L )			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)			
MAR	.	.	.005	.002 <T	.	.	.013	.013
APR	.	.	.013	.003 <T	.	.	.049	.018
MAY	.	.	.085	.004 <T	.	.	.038	.008
JUN	.	.	.440	!CR	.	.	.010	!CR
JUL	.	.	.152	.127	.	.	.001 <T	.243
AUG	.	.	.270	.255	.	.	BDL	.251
SEP	.	.	.107	.011	.013	.031	.	.
OCT	.	.	.015	.004 <T	.001 <T	.013	.	.
NOV	.	.	.036	.028	.023	.026	.	.
DEC	.139	.003 <T	.022	.004 <T	.009	.111	.	.
-----								
TOTAL NITRATES (MG/L )			DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)			
MAR	.	.	3.300	3.360	.	.	3.300	3.320
APR	.	.	2.720	2.750	.	.	4.600	2.820
MAY	.	.	2.510	2.500	.	.	2.620	2.460
JUN	.	.	2.150 RRV	!CR	.	.	2.420	!CR
JUL	.	.	1.770	1.840	.	.	1.770	1.680

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	.	.	2.080	2.060	.	.	2.160	2.150
SEP	.	.	2.630	2.570	2.880	2.890	.	.
OCT	.	.	2.250	1.790	1.770	1.590	.	.
NOV	.	.	3.700 AIN	3.770 AIN	4.030 AIN	3.860 AIN	.	.
DEC	4.790	4.380	4.690	4.740	5.290	5.450	.	.
-----								
NITROGEN TOT KJELD (MG/L )			DET'N LIMIT = .020		GUIDELINE =		N/A	
MAR	.	.	.730	.740	.	.	.380	.420
APR	.	.	.860	.820	.	.	.540	.270
MAY	.	.	.520	.670	.	.	.540	.670
JUN	.	.	.440	.440	.	.	.460	.420
JUL	.	.	.430	.450	.	.	.430	.430
AUG	.	.	.450	.440	.	.	.400	.420
SEP	.	.	.710	.840	.470	.490	.	.
OCT	.	.	.740	.820	.470	.490	.	.
NOV	.	.	.650	.800	.490	.490	.	.
DEC	.710	.970	.870	.890	.570	.580	.	.
-----								
PH (DMSNLESS )			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)			
MAR	.	.	8.020	7.930	.	.	7.990	7.950
APR	.	.	8.550	8.540	.	.	8.640	8.620
MAY	.	.	8.160	8.130	.	.	8.230	8.100
JUN	.	.	8.170	8.160	.	.	8.200	8.150
JUL	.	.	8.170	8.120	.	.	8.150	8.040
AUG	.	.	8.310	8.320	.	.	8.110	8.160

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.	.	8.260	8.200	8.230	8.240	.	.
OCT	.	.	8.290	8.370	8.410	8.350	.	.
NOV	.	.	8.200	8.060	8.190	8.210	.	.
DEC	8.580	8.530	8.480	8.590	8.590	8.550	.	.
PHOSPHORUS FIL REACT (MG/L )			DET'N LIMIT = .5UG/L		GUIDELINE =		N/A	
DEC	.052	.007	.	.	.	.	.	.
PHOSPHORUS TTL-UNFIL (MG/L )			DET'N LIMIT = .002		GUIDELINE = .40 (F2)			
DEC	.085	.012	.	.	.	.	.	.
RESIDUE (TOTAL) (MG/L )			DET'N LIMIT = 1.		GUIDELINE = 500. (A3)			
MAR	.	.	346	346	.	.	359	365
APR	.	.	456	458	.	.	480	471
MAY	.	.	524 CRO	523 CRO	.	.	513 CRO	527 CRO
JUN	.	.	514	525	.	.	523	530
JUL	.	.	388 CRO	397 CRO	.	.	389 CRO	390 CRO
AUG	.	.	496 CRO	498 CRO	.	.	489 CRO	495 CRO
SEP	.	.	503 CRO	507 CRO	487 CRO	491 CRO	.	.
OCT	.	.	447 CRO	438 CRO	505 CRO	509 CRO	.	.
NOV	.	.	537	545	547	531	.	.
DEC	397 CRO	418 CRO	424 CRO	424 CRO	460 CRO	452 CRO	.	.
TURBIDITY (FTU )			DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)			

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.340	.090	.	.	.120	.100
APR	.	.	.250	.200	.	.	.350	.260
MAY	.	.	.160	.160	.	.	.360	.150
JUN	.	.	.550	.670	.	.	.590	.550
JUL	.	.	.470	.660	.	.	.380	.520
AUG	.	.	.320	.300	.	.	.280	.450
SEP	.	.	.190	.130	.360	.270	.	.
OCT	.	.	.150	.120	.260	.190	.	.
NOV	.	.	.230	.280	.670	.430	.	.
DEC	1.000	.270	.470	.400	.330	.360	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
-----								
METALS								
ALUMINUM (MG/L )			DET'N LIMIT = .004		GUIDELINE = .10 (A4)			
MAR	.	.	.070	.066	.	.	.018	.019
APR	.	.	.110	.094	.	.	.029	.027
MAY	.	.	.080	.076	.	.	.110	.087
JUN	.	.	.250	.260	.	.	.140	.210
JUL	.	.	.330	.520	.	.	.230	.310
AUG	.	.	.850	.800	.	.	.100	.330
SEP	.	.	.080	.100	.097	.098	.	.
OCT	.	.	.045	.087	.039	.038	.	.
NOV	.	.	.070	.095	.044	.040	.	.
DEC	.330	.059	.067	.057	.012	.010	.	.
-----								
BARIUM (MG/L )			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)			
MAR	.	.	.021	.021	.	.	BDL	BDL
APR	.	.	.028	.027	.	.	BDL	BDL
MAY	.	.	.029	.028	.	.	.029	.030
JUN	.	.	.029	.029	.	.	.030	.030
JUL	.	.	.025	.024	.	.	.025	.026
AUG	.	.	.024	.023	.	.	.027	.025
SEP	.	.	.027	.027	.027	.027	.	.
OCT	.	.	.020	.019	.022	.022	.	.
NOV	.	.	.024	.025	.025	.025	.	.
DEC	.022	.017	.018	.017	.021	.020	.	.
-----								
BORON (MG/L )			DET'N LIMIT = 0.01		GUIDELINE = 5.000 (A1)			

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

SITE  
TYPE

RAW

TREATED

SITE 1

SITE 2

SITE 3

STANDING

FREE FLOW

STANDING

FREE FLOW

STANDING

FREE FLOW

MAR	.	.	.030	.030	.	.	BDL	BDL
APR	.	.	.060	.070	.	.	.040	.030
MAY	.	.	.070	.070	.	.	.080	.070
JUN	.	.	.050	.060	.	.	.050	.050 <T
JUL	.	.	.050	.050 <T	.	.	.050	.060
AUG	.	.	.060	.070	.	.	.060	.070
SEP	.	.	.070	.070	.060	.060	.	.
OCT	.	.	.070	.050	.090	.090	.	.
NOV	.	.	.096	.100	.093	.097	.	.
DEC	.037 <T	.036 <T	.030 <T	.052	.056	.059	.	.

BERYLLIUM (MG/L )

DET'N LIMIT = 0.001

GUIDELINE = .0002 (H)

MAR	.	.	BDL	BDL	.	.	BDL	BDL
APR	.	.	BDL	BDL	.	.	BDL	BDL
MAY	.	.	BDL	BDL	.	.	BDL	BDL
JUN	.	.	BDL	BDL	.	.	BDL	BDL
JUL	.	.	BDL	BDL	.	.	BDL	BDL
AUG	.	.	.001	BDL	.	.	BDL	BDL
SEP	.	.	BDL	BDL	BDL	BDL	.	.
OCT	.	.	BDL	BDL	BDL	BDL	.	.
NOV	.	.	BDL	BDL	BDL	BDL	.	.
DEC	BDL	BDL	BDL	BDL	BDL	BDL	.	.

CADMIUM (UG/L )

DET'N LIMIT = 0.300

GUIDELINE = 5.000 (A1)

MAR	.	.	BDL	BDL	.	.	BDL	BDL
-----	---	---	-----	-----	---	---	-----	-----

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
APR	.	.	BDL	BDL	.	.	BDL	BDL
MAY	.	.	BDL	BDL	.	.	BDL	.300
JUN	.	.	BDL	BDL	.	.	BDL	BDL
JUL	.	.	BDL	BDL	.	.	BDL	BDL
AUG	.	.	.300	BDL	.	.	BDL	BDL
SEP	.	.	BDL	BDL	BDL	BDL	.	.
OCT	.	.	BDL	BDL	BDL	BDL	.	.
NOV	.	.	BDL	BDL	BDL	BDL	.	.
DEC	BDL	BDL	BDL	BDL	BDL	BDL	.	.
<hr/>								
COBALT (MG/L )      DET'N LIMIT = 0.001      GUIDELINE = 1.0      (H)								
MAR	.	.	BDL	BDL	.	.	.001	.001
APR	.	.	.002	.002	.	.	.001	.001
MAY	.	.	.002	.003	.	.	.002	.002
JUN	.	.	.001	.001	.	.	.001	.001
JUL	.	.	.002	.002	.	.	.002	.002
AUG	.	.	.001	.001	.	.	.002	.002
SEP	.	.	BDL	.001	BDL	BDL	.	.
OCT	.	.	BDL	BDL	BDL	BDL	.	.
NOV	.	.	BDL	BDL	BDL	BDL	.	.
DEC	BDL	BDL	BDL	BDL	BDL	BDL	.	.
<hr/>								
CHROMIUM (MG/L )      DET'N LIMIT = 0.001      GUIDELINE = .05      (A1)								
MAR	.	.	BDL	BDL	.	.	BDL	BDL
APR	.	.	BDL	.001	.	.	.001	.001

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.	.	BDL	BDL	.	.	BDL	BDL
JUN	.	.	BDL	BDL	.	.	BDL	BDL
JUL	.	.	BDL	BDL	.	.	BDL	BDL
AUG	.	.	.001	.001	.	.	.001	.001
SEP	.	.	.003	.004	.004	.004	.	.
OCT	.	.	.003	.002	.003	.003	.	.
NOV	.	.	.005	.005	.004	.005	.	.
DEC	.004	.003	.003	.003	.003	.003	.	.
-----								
COPPER (MG/L )			DET'N LIMIT = .001		GUIDELINE = 1.0 (A3)			
MAR	.	.	.030	.003	.	.	.017	.017
APR	.	.	.023	.002	.	.	.068	.023
MAY	.	.	.018	.003	.	.	.043	.007
JUN	.	.	.003	.003	.	.	.028	.006
JUL	.	.	.019	.007	.	.	.034	.004
AUG	.	.	.012	.011	.	.	.029	.004
SEP	.	.	.015	.029	.250	.013	.	.
OCT	.	.	.025	.025	.300	.011	.	.
NOV	.	.	.023	.003	.350	.015	.	.
DEC	.002	.003	.031	.013	.350	.017	.	.
-----								
IRON (MG/L )			DET'N LIMIT = .002		GUIDELINE = .300 (A3)			
MAR	.	.	.014	.006	.	.	.004	.007
APR	.	.	.010	.014	.	.	.034	.006
MAY	.	.	BDL	BDL	.	.	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	.012	.015	.	.	.010	.014
JUL	.	.	.026	.054	.	.	.070	.099
AUG	.	.	.011	.010	.	.	.014	.009
SEP	.	.	.022	.170	.880	.150	.	.
OCT	.	.	BDL	.010	.016	.009	.	.
NOV	.	.	.009	.014	.008	.008	.	.
DEC	.390	.010	.014	.011	.009	.010	.	.
-----								
MERCURY (UG/L )	DET'N LIMIT = 0.010		GUIDELINE = 1.000 (A1)					
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	.010	.	.	.	.020
MAY	.	.	.	BDL	.	.	.	.010
JUN	.	.	.	.010	.	.	.	.010
JUL	.	.	.	.020	.	.	.	.010
AUG	.	.	.	.020	.	.	.	.020
SEP	.	.	.	.020	.	.010	.	.
OCT	.	.	.	.020	.	.020	.	.
NOV	.	.	.	.010	.	.010	.	.
DEC	BDL	BDL	.	.010	.	.010	.	.
-----								
MANGANESE (MG/L )	DET'N LIMIT = .001		GUIDELINE = .050 (A3)					
MAR	.	.	.002	.002	.	.	BDL	BDL
APR	.	.	.002	.002	.	.	.001	.001
MAY	.	.	.001	.001	.	.	.001	.001
JUN	.	.	.003	.003	.	.	.002	.003

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUL	.	.	.002	.002	.	.	.002	.002
AUG	.	.	.001	.001	.	.	.001	.001
SEP	.	.	.002	.003	.005	.003	.	.
OCT	.	.	.002	.002	.002	.002	.	.
NOV	.	.	.004	.004	.003	.003	.	.
DEC	.026	.003	.003	.003	.003	.003	.	.

MOLYBDENUM (MG/L )      DET'N LIMIT = 0.001      GUIDELINE = .50      (H)

MAR	.	.	BDL	BDL	.	.	BDL	BDL
APR	.	.	BDL	BDL	.	.	.001	.001
MAY	.	.	.002	.002	.	.	.002	.002
JUN	.	.	.001	.001	.	.	.001	.001
JUL	.	.	.001	.001	.	.	.001	.001
AUG	.	.	.001	.001	.	.	.001	.001
SEP	.	.	.001	.003	BDL	.001	.	.
OCT	.	.	.001	.001	.001	.001	.	.
NOV	.	.	BDL	BDL	.001	.001	.	.
DEC	BDL	BDL	BDL	BDL	BDL	BDL	.	.

NICKEL (MG/L )      DET'N LIMIT = 0.001      GUIDELINE = .05      (F3)

MAR	.	.	BDL	BDL	.	.	BDL	BDL
APR	.	.	.003	.002	.	.	.002	.002
MAY	.	.	.004	.003	.	.	.004	.003
JUN	.	.	.002	.002	.	.	.002	.002
JUL	.	.	.007	BDL	.	.	.004	.003

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	.	.	.002	.003	.	.	.003	.003
SEP	.	.	.002	.002	.005	.005	.	.
OCT	.	.	.003	.002	.008	.005	.	.
NOV	.	.	.003	.003	.005	.004	.	.
DEC	.002	.002	.002	.002	.003	.002	.	.
LEAD (MG/L )								
			DET'N LIMIT = 0.003		GUIDELINE = .050 (A1)			
MAR	.	.	BDL	BDL	.	.	.007	.008
APR	.	.	.007	.005	.	.	.013	.010
MAY	.	.	.004	.005	.	.	.004	.004
JUN	.	.	BDL	BDL	.	.	BDL	BDL
JUL	.	.	BDL	BDL	.	.	BDL	BDL
AUG	.	.	.003	.006	.	.	.008	.007
SEP	.	.	.003	.004	.025	.004	.	.
OCT	.	.	BDL	BDL	.024	BDL	.	.
NOV	.	.	BDL	BDL	.018	BDL	.	.
DEC	BDL	BDL	BDL	BDL	.081	.004	.	.
STRONTIUM (MG/L )								
			DET'N LIMIT = .001		GUIDELINE = 2.00 (H)			
MAR	.	.	.250	.260	.	.	.003	.001
APR	.	.	.510	.510	.	.	.003	.003
MAY	.	.	.570	.570	.	.	.580	.590
JUN	.	.	.570	.560	.	.	.550	.570
JUL	.	.	.380	.380	.	.	.370	.370
AUG	.	.	.550	.560	.	.	.570	.560

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.	.	.589	.582	.563	.589	.	.
OCT	.	.	.460	.440	.779	.781	.	.
NOV	.	.	.670	.690	.670	.670	.	.
DEC	.270	.260	.270	.280	.340	.330	.	.
<hr/>								
URANIUM (UG/L )	DET'N LIMIT = .02		GUIDELINE = 20. (A2)					
MAR	.	.	.710	.690	.	.	.610	.620
APR	.	.	.760	.720	.	.	.910	.770
MAY	.	.	.710	.720	.	.	.690	.690
JUN	.	.	.640	.640	.	.	.600	.600
JUL	.	.	.620	.650	.	.	.510	.610
AUG	.	.	.820	.750	.	.	.700	.760
SEP	.	.	.990	.960	.930	.780	.	.
OCT	.	.	.820	.870	.950	.910	.	.
NOV	.	.	.960	.920	.940	.900	.	.
DEC	1.100	1.200	1.200	1.200	1.000	1.100	.	.
<hr/>								
VANADIUM (MG/L )	DET'N LIMIT = .001		GUIDELINE = .10 (H)					
MAR	.	.	BDL	BDL	.	.	.001	.001
APR	.	.	.001	.001	.	.	.001	.001
MAY	.	.	.001	.001	.	.	.001	.001
JUN	.	.	.001	.001	.	.	.001	.001
JUL	.	.	.002	.002	.	.	.002	.002
AUG	.	.	.001	.001	.	.	.001	.001
SEP	.	.	.004	.003	.003	.002	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
OCT	.	.	BDL	BDL	BDL	BDL	.	.
NOV	.	.	BDL	.001	BDL	BDL	.	.
DEC	.002	.002	BDL	BDL	BDL	BDL	.	.
<hr/>								
ZINC (MG/L )	DET'N LIMIT = .001		GUIDELINE = 5.00 (A3)					
MAR	.	.	.015	BDL	.	.	.002	.001
APR	.	.	.010	.004	.	.	.021	.009
MAY	.	.	.020	.009	.	.	.035	.013
JUN	.	.	.001	BDL	.	.	.017	.002
JUL	.	.	.009	.003	.	.	.033	.005
AUG	.	.	.004	.010	.	.	.044	.006
SEP	.	.	.011	.008	.032	.007	.	.
OCT	.	.	.013	.004	.037	.006	.	.
NOV	.	.	.012	.006	.035	.006	.	.
DEC	.008	.004	.020	.004	.033	.008	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
-----								
CHLOROAROMATICS								
HEXACHLOROBUTADIENE (NG/L )			DET'N LIMIT = 1.000		GUIDELINE = 450. (D4)			
MAR	.	.	.	BDL	.	.	.	3.000 <T
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
-----								
123 TRICHLOROBENZENE (NG/L )			DET'N LIMIT = 5.000		GUIDELINE = 10000. (I)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	8.000 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
-----								
1235 T-CHLOROBENZENE (NG/L )			DET'N LIMIT = 1.000		GUIDELINE = 10000. (I)			

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	13.000
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
-----								
124 TRICHLOROBENZENE (NG/L )			DET'N LIMIT = 5.000		GUIDELINE = 10000. (1)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	5.000 <T	.	.	.	24.000 <T
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
-----								
135 TRICHLOROBENZENE (NG/L )			DET'N LIMIT = 5.000		GUIDELINE = 10000. (D4)			
MAR	.	.	.	BDL	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

SITE  
TYPE

RAW

TREATED

SITE 1

SITE 2

SITE 3

STANDING

FREE FLOW

STANDING

FREE FLOW

STANDING

FREE FLOW

APR	.	.	.	BDL	.	.	.	17.000 <T
MAY	.	.	.	BDL	.	.	.	9.000 <T
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.

HEXACHLOROETHANE (NG/L )

DET'N LIMIT = 1.000

GUIDELINE = 1900. (D4)

MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	2.000 <T	.	.	.	10.000 <T
MAY	.	.	.	6.000 <T	.	.	.	9.000 <T
JUN	.	.	.	1.000 <T	.	.	.	5.000 <T
JUL	.	.	.	5.000 <T	.	.	.	BDL
AUG	.	.	.	2.000 <T	.	.	.	7.000 <T
SEP	.	.	.	BDL	.	3.000 <T	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.

236 TRICHLOROTOLUENE (NG/L )

DET'N LIMIT = 5.000

GUIDELINE = N/A

MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	9.000 <T	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.

26A TRICHLOROTOLUENE (NG/L )

DET'N LIMIT = 5.000

GUIDELINE = N/A

MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	6.000 <T
MAY	.	.	.	8.000 <T	.	.	.	11.000 <T
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3		
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW	
-----									
PESTICIDES & PCB									
ALPHA BHC (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 700. (G)					
MAR	.	.	.	BDL	.	.	.	BDL	
APR	.	.	.	BDL	.	.	.	1.000 <T	
MAY	.	.	.	1.000 <T	.	.	.	1.000 <T	
JUN	.	.	.	1.000 <T	.	.	.	1.000 <T	
JUL	.	.	.	1.000 <T	.	.	.	BDL	
AUG	.	.	.	2.000 <T	.	.	.	2.000 <T	
SEP	.	.	.	1.000 <T	.	1.000 <T	.	.	
OCT	.	.	.	1.000 <T	.	BDL	.	.	
NOV	.	.	.	BDL	.	BDL	.	.	
DEC	BDL	BDL	.	BDL	.	BDL	.	.	
-----									
BETA BHC (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 300. (G)					
MAR	.	.	.	BDL	.	.	.	BDL	
APR	.	.	.	BDL	.	.	.	1.000 <T	
MAY	.	.	.	BDL	.	.	.	BDL	
JUN	.	.	.	BDL	.	.	.	BDL	
JUL	.	.	.	BDL	.	.	.	BDL	
AUG	.	.	.	6.000 <T	.	.	.	2.000 <T	
SEP	.	.	.	BDL	.	BDL	.	.	
OCT	.	.	.	BDL	.	BDL	.	.	
NOV	.	.	.	BDL	.	BDL	.	.	
DEC	BDL	BDL	.	BDL	.	BDL	.	.	
-----									
LINDANE (NG/L )		DET'N LIMIT = 1.000		GUIDELINE = 4000.0 (A1)					

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.	3.000 <T	.	.	.	2.000 <T
APR	.	.	.	3.000 <T	.	.	.	10.000 <T
MAY	.	.	.	6.000 <T	.	.	.	3.000 <T
JUN	.	.	.	6.000 <T	.	.	.	4.000 <T
JUL	.	.	.	3.000 <T	.	.	.	BDL
AUG	.	.	.	11.000	.	.	.	8.000 <T
SEP	.	.	.	4.000 <T	.	3.000 <T	.	.
OCT	.	.	.	3.000 <T	.	2.000 <T	.	.
NOV	.	.	.	3.000 <T	.	4.000 <T	.	.
DEC	1.000 <T	1.000 <T	.	1.000 <T	.	2.000 <T	.	.
<hr/>								
HEPTACHLOR (NG/L )			DET'N LIMIT = 1.000		GUIDELINE = 3000.0 (A1)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	4.000 <T	.	.	.	1.000 <T
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
HCB (NG/L )			DET'N LIMIT = 1.000		GUIDELINE = 10.0 (C1)			
MAR	.	.	.	BDL	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	1.000 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
SPECIFIC PESTICIDES								
ATRAZINE (NG/L )			DET'N LIMIT = 50.00		GUIDELINE = 60000. (B3)			
MAR	.	.	.	170.000 <T	.	.	.	180.000 <T
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	670.000	.	.	.	110.000 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	130.000 <T	.	130.000 <T	.	.
DEC	300.000 <T	370.000 <T	.	300.000 <T	.	400.000 <T	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
			<hr/>					
PHENOLICS								
PHENOL (UG/L )	DET'N LIMIT = N/A		GUIDELINE = 2.00 (A3)					
DEC	.200 <T	.200 <T	.	.	.	.	.	.

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## WATER TREATMENT PLANT

## DISTRIBUTION SYSTEM

SITE

RAW

TREATED

SITE 1

SITE 2

SITE 3

TYPE

STANDING

FREE FLOW

STANDING

FREE FLOW

STANDING

FREE FLOW

POLYAROMATIC HYDROC

BENZO(B) FLUORANTHEN (NG/L )

DET'N LIMIT = 0

GUIDELINE =

N/A

DEC

5.000 &lt;T

BDL

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.

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TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
VOLATILES								
BENZENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 5.0 (D1)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.400 <T	.	.	.	.400 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	.050 <T	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
TOLUENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 100.0 (G)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	2.000	.	.	.	1.000
MAY	.	.	.	BDL	.	.	.	.300 <T
JUN	.	.	.	.200 <T	.	.	.	.200 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	.000 APS	.	.	.	.000 APS
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	.050 <T	.	.
NOV	.	.	.	.050 UCS	.	.100 UCS	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
ETHYLBENZENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 3400. (D3)			

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.200 <T	.	.	.	.150 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	.050 <T	.	BDL	.	.
DEC	BDL	BDL	.	.050 <T	.	BDL	.	.
-----								
P-XYLENE (UG/L )	DET'N LIMIT = 0		GUIDELINE = 620. (G)					
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.200 <T	.	.	.	.300 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
-----								
M-XYLENE (UG/L )	DET'N LIMIT = 0		GUIDELINE = 620. (G)					
MAR	.	.	.	BDL	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.000 RMP	.	.	.	.000 RMP
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
O-XYLENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 620. (G)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.100 <T	.	.	.	.100 <T
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
1,1 DICHLOROETHYLENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 7.0 (D1)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAY	.	.	.	.000 SPS	.	.	.	BDL
JUN	.	.	.	.000 SPS	.	.	.	.000 SPS
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	.000 SPS	.	.000 SPS	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
DICHLOROMETHANE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 1750. (D3)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	ICS	.	.	.	ICS
MAY	.	.	.	.000 SPS	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
T1,2DICHLOROETHYLENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 350. (D3)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	.000 SPS	.	.	.	BDL

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
1,1 DICHLOROETHANE (UG/L )			DET'N LIMIT = 0		GUIDELINE = N/A			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	.900 <T	.	.	.	1.000
MAY	.	.	.	.800 <T	.	.	.	.400 <T
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	.800 <T	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
CHLOROFORM (UG/L )			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
MAR	.	.	.	104.000	.	.	.	102.000
APR	.	.	.	100.000	.	.	.	100.000
MAY	.	.	.	116.000	.	.	.	114.000
JUN	.	.	.	191.000	.	.	.	185.000

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUL	.	.	.	330.000	.	.	.	260.000
AUG	.	.	.	165.000	.	.	.	160.000
SEP	.	.	.	130.000	.	150.000	.	.
OCT	.	.	.	134.000	.	119.000	.	.
NOV	.	.	.	90.000	.	85.000	.	.
DEC	BDL	105.400	.	99.800	.	96.800	.	.
111, TRICHLOROETHANE (UG/L )      DET'N LIMIT = 0      GUIDELINE = 200. (D1)								
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	.400 <T	.	.	.	.500 <T
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	.	.	.	BDL	.	.	.	BDL
AUG	.	.	.	BDL	.	.	.	BDL
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
DICHLOROBROMOMETHANE (UG/L )      DET'N LIMIT = 0      GUIDELINE = 350.0 (A1+)								
MAR	.	.	.	10.000	.	.	.	9.000
APR	.	.	.	16.000	.	.	.	17.000
MAY	.	.	.	21.500	.	.	.	21.700
JUN	.	.	.	28.000	.	.	.	24.900
JUL	.	.	.	25.000	.	.	.	22.800

TABLE 5

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	.	.	.	26.700	.	.	.	26.300
SEP	.	.	.	25.800	.	24.300	.	.
OCT	.	.	.	18.200	.	23.200	.	.
NOV	.	.	.	17.750	.	18.350	.	.
DEC	BDL	10.600	.	10.300	.	13.100	.	.
<hr/>								
CHLORODIBROMOMETHANE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	1.000	.	.	.	1.000
MAY	.	.	.	2.100	.	.	.	2.200
JUN	.	.	.	2.800	.	.	.	2.100
JUL	.	.	.	1.300	.	.	.	1.300
AUG	.	.	.	2.600	.	.	.	2.600
SEP	.	.	.	3.200	.	2.300	.	.
OCT	.	.	.	1.200	.	2.000	.	.
NOV	.	.	.	1.700	.	1.700	.	.
DEC	BDL	.100 <T	.	.200 <T	.	.400 <T	.	.
<hr/>								
T-CHLOROETHYLENE (UG/L )			DET'N LIMIT = 0		GUIDELINE = 10.0 (C2)			
MAR	.	.	.	BDL	.	.	.	BDL
APR	.	.	.	BDL	.	.	.	BDL
MAY	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.150 <T	.	.	.	.200 <T
JUL	.	.	.	.000 APS	.	.	.	.000 APS
AUG	.	.	.	BDL	.	.	.	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.	.	.	BDL	.	BDL	.	.
OCT	.	.	.	BDL	.	BDL	.	.
NOV	.	.	.	BDL	.	BDL	.	.
DEC	BDL	BDL	.	BDL	.	BDL	.	.
<hr/>								
TOTL TRIHALOMETHANES (UG/L )			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1)			
MAR	.	.	.	114.000	.	.	.	111.000
APR	.	.	.	117.000	.	.	.	118.000
MAY	.	.	.	139.600	.	.	.	137.900
JUN	.	.	.	221.800	.	.	.	212.000
JUL	.	.	.	356.300	.	.	.	284.100
AUG	.	.	.	194.300	.	.	.	188.900
SEP	.	.	.	159.000	.	176.600	.	.
OCT	.	.	.	149.400	.	144.200	.	.
NOV	.	.	.	109.450	.	105.050	.	.
DEC	BDL	116.100	.	110.300	.	110.300	.	.

TABLE 6

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN ----	PARAMETER -----	ANALYSED -----	DETECTION LIMIT -----	GUIDELINE -----	
METALS	ARSENIC	42	0.001	.050 (A1)	MG/L
	SELENIUM	42	0.001	.010 (A1)	MG/L
CHLOROAROMATICS	1234 T-CHLOROBENZENE	22	1.000	10000. (I)	NG/L
	1245 T-CHLOROBENZENE	22	1.000	38000. (D4)	NG/L
	OCTACHLOROSTYRENE	22	1.000	N/A	NG/L
	PENTACHLOROBENZENE	22	1.000	74000. (D4)	NG/L
	245 TRICHLOROTOLUENE	22	5.000	N/A	NG/L
PESTICIDES & PCB	ALDRIN	22	1.000	700.0 (A1)	NG/L
	ALPHA CHLORDANE	22	2.000	7000.0 (A1)	NG/L
	GAMMA CHLORDANE	22	2.000	7000.0 (A1)	NG/L
	DIELDRIN	22	2.000	700.0 (A1)	NG/L
	METHOXYCHLOR	22	5.000	100000. (A1)	NG/L
	THIODAN I	22	2.000	74000. (D4)	NG/L
	THIODAN II	22	4.000	74000. (D4)	NG/L
	ENDRIN	22	4.000	200.0 (A1)	NG/L
	THIODAN SULPHATE	22	4.000	N/A	NG/L
	HEPTACHLOR EPOXIDE	22	1.000	3000.0 (A1)	NG/L
	MIREX	22	5.000	N/A	NG/L
	OXYCHLORDANE	22	2.000	N/A	NG/L
	OPDDT	22	5.000	30000. (A1)	NG/L
	PCB	22	20.000	3000. (A2)	NG/L
	PP-DDD	22	5.000	N/A	NG/L
	PPDDE	22	1.000	30000. (A1)	NG/L
	PPDDT	22	5.000	30000. (A1)	NG/L
	ATRATONE	22	50.	N/A	NG/L
	ALACHLOR	22	500.	35000. (D2)	NG/L
	ETHYLENE DIBROMIDE	22	0	50.0 (G)	UG/L
POLYAROMATIC HYDROC	PHENANTHRENE	2	0	N/A	NG/L
	ANTHRACENE	2	0	N/A	NG/L
	FLUORANTHENE	2	0	42000 (D4)	NG/L
	PYRENE	2	0	N/A	NG/L
	BENZO(A)ANTHRACENE	2	0	N/A	NG/L
	CHRYSENE	2	0	N/A	NG/L
	DIMETH. BENZ(A)ANTHR	2	0	N/A	NG/L
	BENZO(E)PYRENE	2	0	N/A	NG/L
	BENZO(J) FLUORANTHEN	2	N/A	N/A	NG/L
	PERYLENE	2	0	N/A	NG/L
	BENZO(K) FLUORANTHEN	2	N/A	N/A	NG/L
	BENZO (A) PYRENE	2	0	10 (B1)	NG/L
	BENZO(G,H,I) PERYLEN	2	0	N/A	NG/L
	DIBENZO(A,H) ANTHRAC	2	0	N/A	NG/L
	INDENO(1,2,3-C,D) PY	2	0	N/A	NG/L
	BENZO(B) CHRYSENE	2	0	N/A	NG/L
	ANTHANTHRENE	2	N/A	N/A	NG/L
	CORONENE	2	0	N/A	NG/L
SPECIFIC PESTICIDES	TOXAPHENE	22	N/A	5000. (A1)	NG/L
	AMETRYNE	22	50.00	300000. (D3)	NG/L

TABLE 6

## DRINKING WATER SURVEILLANCE PROGRAM BRANTFORD W.T.P. 1987

## COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE
----	-----	-----	-----	-----
SPECIFIC PESTICIDES	BLADEX	22	100.00	10000. (B3) NG/L
	PROMETONE	22	50.00	52500. (D3) NG/L
	PROPAZINE	22	50.00	16000. (D2) NG/L
	PROMETRYNE	22	50.00	1000. (B3) NG/L
	SENCOR	22	100.00	80000. (B2) NG/L
	SIMAZINE	22	50.00	10000. (B3) NG/L
	METOLACHLOR	22	500.	50000. (B3) NG/L
VOLATILES	1,2 DICHLOROETHANE	22	0	5.0 (D1) UG/L
	CARBON TETRACHLORIDE	22	0	5.0 (D1) UG/L
	1,2 DICHLOROPROPANE	22	0	10.0 (G) UG/L
	TRICHLOROETHYLENE	22	0	5.0 (D1) UG/L
	112 TRICHLOROETHANE	22	0	.60 (D4) UG/L
	BROMOFORM	22	0	350.0 (A1+) UG/L
	1122 T-CHLOROETHANE	22	0	0.17 (D4) UG/L
	CHLOROBENZENE	22	0	1510. (D3) UG/L
	1,4 DICHLOROBENZENE	22	0	75.0 (D1) UG/L
	1,3 DICHLOROBENZENE	22	0	130. (G) UG/L
	1,2 DICHLOROBENZENE	22	0	130. (G) UG/L
	TRIFLUOROCHLOROTOLUE	22	0	N/A UG/L

## Appendix A

### DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

#### Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate ( and retrofit if necessary ) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw ( ambient water ) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

#### Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

#### DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

#### PROGRAM INPUTS

#### PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and

missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

#### 4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

#### 5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

#### 6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area;
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

#### 7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

#### FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.

## LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will be made and intercomparison data documented.

#### PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

#### PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

#### QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

### ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

### REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

### ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1

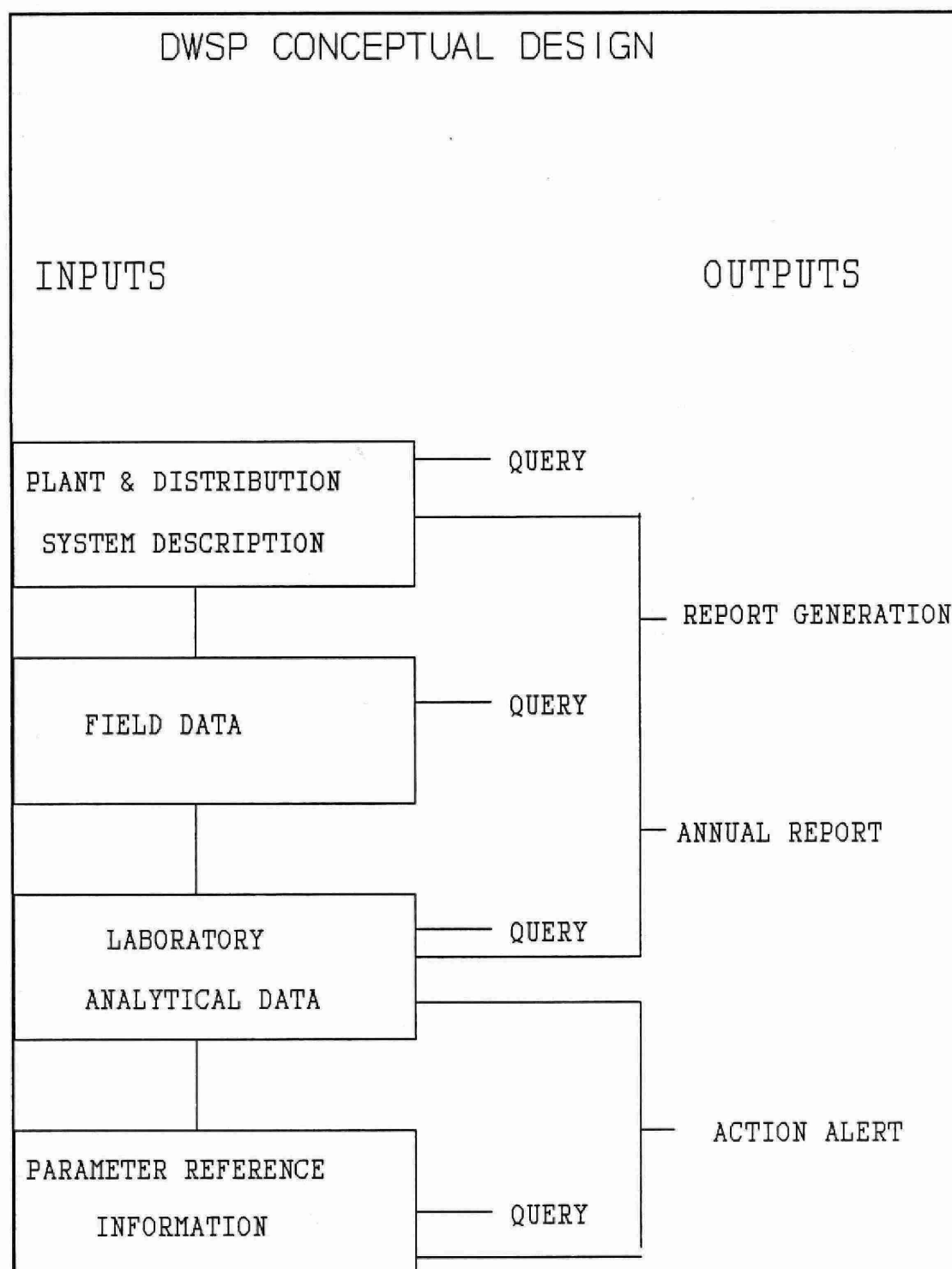


FIG.2

## MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

(B2001P)  
REFERENCE  
BENZENE

## PARAMETER

SOURCE FROM	TO	METHOD	TARG	UNIT	NOTE
EPA C 86/04		NOMETH	.00	063000 UG/L	RMCL
EPAA C 80/11		NOMETH	6.60	063000 UG/L	
FERC C 84/05		NOMETH	1.00	063000 UG/L	
WHO C 84/01		NOMETH	10.00	064000 UG/L	

## DESCRIPTION: NAME: BENZENE

CAS#: 71432

MOLECULAR FORMULAE:  $C_6H_6$ 

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L

SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27),  
CYCLOHEXATRIENE (41)CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE,  
NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE,  
AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)

## PROPERTIES:

SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)

THRESHOLD ODOUR: NO DATA

THRESHOLD TASTE: 0.5 MG/L IN WATER (39)

ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING  
ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL  
TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE  
MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL  
QUANTITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLYSOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL  
TAR DISTILLATION, FOOD PROCESSING, TANNING.USES: PREPARATION OF ETHYL BENZENE USED AS A STYRENE  
MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE INPESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY,  
DEGREASING AND CLEANSING AGENT, GASOLINE.TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES  
MUCOUS MEMBRANES, SYMPTOMS INCLUDE RESTLESSNESS,  
CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE;  
CHRONIC - ANEMIA AND LEUKEMIA (45).

CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN

REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM  
FOLLOWED BY SEDIMENTATION, COAGULATION AND  
FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).

MOLECULAR WEIGHT: 78.12 GRAMS

MELTING POINT: 5.5 DEGREES C (27)

BOILING POINT: 80.1 DEGREES C (27)

SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)

VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C

HENRY'S LAW CONSTANT: 0.00555 ATM  $M_2$ /MOLE

LOG OCT./WATER PAR.COEFF:K=1.0 1/N=1.6 R=.97 PH=5.3

## Appendix B

### DWSP SAMPLING GUIDELINE

#### i) RAW and TREATED at PLANT

General Chemistry	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-rinse bottle with sample three times and discard water</li><li>-fill to line</li></ul>
Bacti	<ul style="list-style-type: none"><li>-250 mL clear glass bottle with white seal on cap</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-avoid touching bottle neck or inside of cap</li><li>-fill to top of red label as marked</li></ul>
Metals	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle with white lid</li><li>-rinse bottle and cap three times, discard</li><li>-fill to line</li><li>-add 10 drops nitric acid (Caution: <math>\text{HNO}_3</math> is corrosive)</li></ul>
Volatiles (OPOPUP)	<ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-do <u>not</u> rinse bottle</li><li>-tilt bottle when filling</li><li>-fill bottle completely; there should be no air bubbles.</li></ul>
Organic (OWOC), (OWTRI), (OAPAHX)	<ul style="list-style-type: none"><li>-1 liter brown glass bottle per scan</li><li>-do <u>not</u> rinse bottle</li><li>-fill to approx. 1" from top</li><li>-when 'special pesticides' are requested three extra bottles per sample must be submitted</li></ul>
Cyanide	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-do <u>not</u> rinse bottle</li><li>-fill to approx. 1" from top</li><li>-add 10 drops sodium hydroxide (Caution: <math>\text{NaOH}</math> is corrosive)</li></ul>

Mercury

- 250 mL clear glass bottle
- rinse bottle and cap three times, discard then fill to top of label
- add 20 drops each nitric acid and potassium dichromate
- (Caution:  $\text{HNO}_3$  and  $\text{KCrO}_7$  corrosive)

Phenols

- 250 mL clear glass bottle
- do not rinse bottle
- fill to top of label as marked

Steps

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry

- 500 mL clear plastic bottle
- rinse bottle with sample three times and discard
- fill to line

Metals

- 500 mL clear plastic bottle with white lid
- rinse bottle and cap three times, discard
- fill to line
- add 10 drops nitric acid
- (Caution:  $\text{HNO}_3$  is corrosive)

Steps:

1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-rinse bottle with sample three times and discard water</li><li>-fill to line</li></ul>
Bacti	<ul style="list-style-type: none"><li>-250 mL clear glass bottle with white seal on cap</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-avoid touching bottle neck or inside of cap</li><li>-fill to top of red label as marked</li></ul>
Metals	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle with white lid</li><li>-rinse bottle and cap three times, discard</li><li>-fill to line</li><li>-add 10 drops nitric acid (Caution: <math>\text{HNO}_3</math> is corrosive)</li></ul>
Volatiles (OPOPUP)	<ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-do <u>not</u> rinse bottle; preservative has been added</li><li>-tilt bottle when filling</li><li>-fill bottle completely; there should be no air bubbles</li></ul>
Organic (OWOC), (OWTRI)	<ul style="list-style-type: none"><li>-1 liter brown glass bottle per scan</li><li>-do <u>not</u> rinse bottle: preservative has been added</li><li>-fill to approx. 1" from top</li></ul>
Cyanide	<ul style="list-style-type: none"><li>-500 mL clear plastic bottle</li><li>-do <u>not</u> rinse bottle: preservative has been added</li><li>-fill to approx. 1" from top</li><li>-add 10 drops sodium hydroxide (Caution: <math>\text{NaOH}</math> is corrosive)</li></ul>
Mercury	<ul style="list-style-type: none"><li>-250 mL clear glass bottle</li><li>-rinse bottle and cap three times, discard then fill to top of label</li><li>-add 20 drops each nitric acid and potassium dichromate (Caution: <math>\text{HNO}_3</math> and <math>\text{KCrO}_7</math> corrosive)</li></ul>

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



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